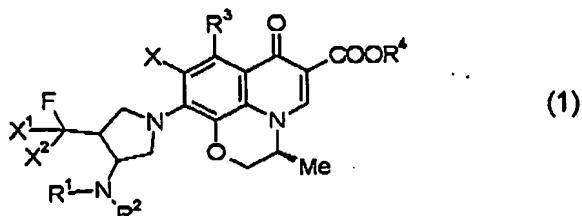


CLAIMS

1. A compound represented by the following formula (1):

[Chemical formula 24]

5



[wherein, R<sup>1</sup> represents a hydrogen atom, an alkyl group having from 1 to 6 carbon atoms or a cycloalkyl group having from 3 to 6 carbon atoms, or a substituted carbonyl group derived from an amino acid, dipeptide or tripeptide, with the proviso that the alkyl group may have, as the substituent, at least one group selected from the group consisting of a hydroxyl group, an amino group, halogen atoms, alkylthio groups having from 1 to 6 carbon atoms, and alkoxy groups having from 1 to 6 carbon atoms;

10 alkyl group may have, as the substituent, at least one group selected from the group consisting of a hydroxyl group, an amino group, halogen atoms, alkylthio groups having from 1 to 6 carbon atoms, and alkoxy groups having from 1 to 6 carbon atoms;

R<sup>2</sup> represents a hydrogen atom, an alkyl group having from 1 to 6 carbon atoms or a cycloalkyl group having from 3 to 6 carbon atoms, with the proviso that the alkyl group may have, as the substituent, at least one group selected from the group consisting of a hydroxyl group, an amino group, halogen atoms, alkylthio groups having from 1 to 6 carbon atoms, and alkoxy groups having from 1 to 6 carbon atoms;

15 R<sup>3</sup> represents a hydrogen atom, amino group, halogen atom or alkyl group having from 1 to 6 carbon atoms, with the proviso that the amino group may have, as the substituent, one or two groups selected from the group consisting of a formyl group,

20 alkyl groups having from 1 to 6 carbon atoms and acyl groups having from 2 to 6 carbon atoms;

$R^4$  represents a hydrogen atom, phenyl group, acetoxyethyl group, pivaloyloxymethyl group, ethoxycarbonyl group, choline group, dimethylaminoethyl group, 5-indanyl group, phthalidinyl group, 5-alkyl-2-oxo-1,3-dioxol-4-ylmethyl group, 3-acetoxy-2-oxobutyl group, alkyl group having from 1 to 6 carbon atoms,

5 alkoxymethyl group having from 2 to 7 carbon atoms, or a phenylakyl group composed of an alkylene group having from 1 to 6 carbon atoms and a phenyl group;

$X^1$  and  $X^2$  each independently represents a hydrogen atom or halogen atom,

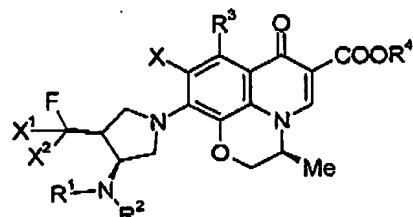
and

$X$  represents a hydrogen atom or a halogen atom], salt thereof, or a hydrate

10 thereof.

2. A compound, salt thereof, or a hydrate thereof according to Claim 1, wherein the compound of the formula (1) has a structure represented by the following formula:

15 [Chemical formula 25]



[wherein,  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $X^1$ ,  $X^2$  and  $X$  have the same meanings as described above].

20 3. A compound, salt thereof, or a hydrate thereof according to Claim 1 or 2, wherein in the formula (1),  $X^1$  and  $X^2$  each represents a hydrogen atom.

4. A compound, salt thereof, or a hydrate thereof according to Claim 1 or 2, wherein in the formula (1), either one of  $X^1$  or  $X^2$  represents a fluorine atom, while the other one represents a hydrogen atom.

5 5. A compound, salt thereof, or a hydrate thereof according to any one of Claims 1 to 4, wherein in the formula (1),  $R^1$  and  $R^2$  each represents a hydrogen atom.

6. A compound, salt thereof, or a hydrate thereof according to any one of Claims 1 to 4, wherein in the formula (1),  $R^1$  represents a substituted carbonyl group 10 derived from an amino acid, dipeptide or tripeptide and  $R^2$  represents a hydrogen atom.

7. A compound, salt thereof, or a hydrate thereof according to any one of Claims 1 to 4, wherein in the formula (1), either one of  $R^1$  or  $R^2$  represents a hydrogen atom, while the other one is a cyclopropyl group.

15

8. A compound, salt thereof, or a hydrate thereof according to any one of Claims 1 to 7, wherein in the formula (1), wherein X represents a fluorine atom.

9. A compound, salt thereof, or a hydrate thereof according to any one of 20 Claims 1 to 8, wherein in the formula (1),  $R^3$  represents a hydrogen atom.

10. A compound, salt thereof, or a hydrate thereof according to any one of Claims 1 to 9, wherein in the formula (1),  $R^4$  represents a hydrogen atom.

11. 10-[3-Amino-4-fluoromethylpyrrolidin-1-yl]-9-fluoro-2,3-dihydro-3-(S)-methyl-7-oxo-7H-pyrido[1,2,3-de][1,4]benzoxazine-6-carboxylic acid, salt thereof, or a hydrate thereof.

5           12. 10-[3-Amino-4-difluoromethylpyrrolidin-1-yl]-9-fluoro-2,3-dihydro-3-(S)-methyl-7-oxo-7H-pyrido[1,2,3-de][1,4]benzoxazine-6-carboxylic acid, salt thereof, or a hydrate thereof.

10       13. 10-[*cis*-3-Amino-4-fluoromethylpyrrolidin-1-yl]-9-fluoro-2,3-dihydro-3-(S)-methyl-7-oxo-7H-pyrido[1,2,3-de][1,4]benzoxazine-6-carboxylic acid, salt thereof, or a hydrate thereof.

15       14. 10-[*cis*-3-Amino-4-difluoromethylpyrrolidin-1-yl]-9-fluoro-2,3-dihydro-3-(S)-methyl-7-oxo-7H-pyrido[1,2,3-de][1,4]benzoxazine-6-carboxylic acid, salt thereof, or a hydrate thereof.

15. A compound or salt thereof, or a hydrate thereof according to any one of Claims 1 to 14, wherein the compound of the formula (1) is a stereochemically pure compound.

20       16. 10-[3-(S)-Amino-4-(S)-fluoromethylpyrrolidin-1-yl]-9-fluoro-2,3-dihydro-3-(S)-methyl-7-oxo-7H-pyrido[1,2,3-de][1,4]benzoxazine-6-carboxylic acid, salt thereof, or a hydrate thereof.

17. 10-[3-(S)-Amino-4-(S)-difluoromethylpyrrolidin-1-yl]-9-fluoro-2,3-dihydro-3-(S)-methyl-7-oxo-7H-pyrido[1,2,3-de][1,4]benzoxazine-6-carboxylic acid, salt thereof, or a hydrate thereof.

5 18. A medicament comprising as an effective ingredient a compound, salt thereof, or a hydrate thereof as claimed in any one of Claims 1 to 17.

19. An antimicrobial agent comprising as an effective ingredient a compound, salt thereof, or a hydrate thereof as claimed in any one of Claims 1 to 17.

10 20. A therapeutic agent for infections, which comprises as an effective ingredient a compound, salt thereof, or a hydrate thereof as claimed in any one of Claims 1 to 17.

15 21. A method of treating a disease, which comprises administering an effective amount of a compound, salt thereof, or a hydrate thereof as claimed in any one of Claims 1 to 17.

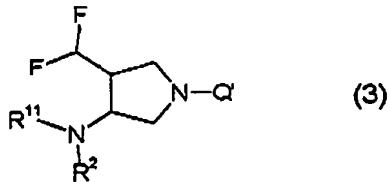
20 22. A method of treating an infection, which comprises administering an effective amount of a compound, salt thereof, or a hydrate thereof as claimed in any one of Claims 1 to 17.

25 23. A process of producing a medicament, which comprises incorporating a compound, salt thereof, or a hydrate thereof as claimed in any one of Claims 1 to 17 as an effective ingredient.

24. A process of producing an antimicrobial agent, which comprises incorporating a compound, salt thereof, or a hydrate thereof as claimed in any one of Claims 1 to 17 as an effective ingredient.

5 25. A process of producing a therapeutic agent for infections, which comprises incorporating a compound, salt thereof, or a hydrate thereof as claimed in any one of Claims 1 to 17 as an effective ingredient.

26. A compound represented by the following formula (3):  
10 [Chemical formula 26]



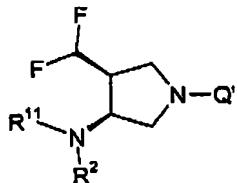
[wherein, R<sup>11</sup> represents a hydrogen atom, an alkyl group having from 1 to 6 carbon atoms or a cycloalkyl group having from 3 to 6 carbon atoms, or an amino-protecting group, or a substituted carbonyl group derived from an amino acid, dipeptide or peptide having an amino group which is unsubstituted or may be protected, with the proviso that the alkyl group may have, as the substituent, at least one group selected from the group consisting of a hydroxyl group, an amino group, halogen atoms, alkylthio groups having from 1 to 6 carbon atoms and alkoxy groups having from 1 to 6 carbon atoms;

15 20 R<sup>2</sup> has the same meaning as defined in the formula (1); and  
Q' means an amino-protecting group or hydrogen atom], salt thereof, or a hydrate thereof.

27. A compound, salt thereof, or a hydrate thereof according to Claim 1, wherein the compound of the formula (3) is a compound having a structure represented by the following formula (4):

[Chemical formula 27]

5



[wherein, R<sup>11</sup>, R<sup>2</sup> and Q' have the same meanings as defined above].

28. A compound, salt thereof, or a hydrate thereof according to Claim 26  
10 or 27, wherein the amino protecting group is selected from the group consisting of alkoxy carbonyl groups which may have a substituent, aralkyloxy carbonyl groups which may have a substituent, acyl groups which may have a substituent, alkyl groups which may have a substituent, aralkyl groups which may have a substituent, and substituted silyl groups.

15

29. A compound, salt thereof, or a hydrate thereof according to Claim 26,  
27 or 28, wherein the amino protecting group is selected from the group consisting of: tertiary butoxycarbonyl group, 2,2,2-trichloroethoxycarbonyl group, benzyloxycarbonyl group, para-methoxybenzyloxycarbonyl group, para-nitrobenzyloxycarbonyl group,  
20 acetyl group, methoxyacetyl group, trifluoroacetyl group, chloroacetyl group, pivaloyl group, formyl group, benzoyl group, tertiary butyl group, benzyl group, para-nitrobenzyl group, para-methoxybenzyl group, (R)-1-phenylethyl group, (S)-1-phenylethyl group, triphenylmethyl group, methoxymethyl group, tertiary butoxymethyl

group, tetrahydropyranyl group, 2,2,2-trichloroethoxymethyl group, trimethylsilyl group, isopropyldimethylsilyl group, tertiary butyldimethylsilyl group, tribenzylsilyl group, and tertiary butyldiphenylsilyl group.

5        30.      A compound, salt thereof, or a hydrate thereof according to any one of  
Claims 26 to 29, wherein R<sup>11</sup> and Q' represent amino protecting groups which are not  
the same.

10       31.      A compound, salt thereof, or a hydrate thereof according to any one of  
Claims 26 to 29, wherein R<sup>11</sup> and Q' represent amino protecting groups which are to be  
deprotected or cleaved under different reaction conditions.

15       32.      Cis-3-(tert-butoxycarbonylamino-4-difluoromethyl)-1-(R)-  
phenylmethylpyrrolidine, salt thereof, or a hydrate thereof .

33.      Cis-3-(tert-butoxycarbonylamino-4-difluoromethyl)-pyrrolidine, salt  
thereof, or a hydrate thereof.

20       34.      A compound, salt thereof, or a hydrate thereof according to any one of  
Claims 26 to 33, wherein the compound of the formula (3) is a stereochemically single  
compound.

25       35.      3-(S)-(Tert-butoxycarbonylamino)-4-(S)-difluoromethyl-1-(R)-  
phenylmethylpyrrolidine, salt thereof, or a hydrate thereof .

36. 3-(S)-(Tert-butoxycarbonylamino)-4-(S)-difluoromethyl-pyrrolidine,  
salt thereof, or a hydrate thereof.

37. Use of a compound, salt thereof, or a hydrate thereof as claimed in any  
5 one of Claims 26 to 36 for the production of the compound represented by the formula  
(1).